CLAIMS

1. An optical information recording method which records a data overlapping a visibly second information on a first information in an optical information recording medium by intermittently irradiating a laser beam to so that a pit line is successively formed,

the second information being recorded in a predetermined area in a radius direction and a angular direction on the optical information recording medium,

the second information being recorded according to a change of a pit width based on a change of power of the laser beam, a change of a pit length based on an on/off control of the laser beam, or a change of depression or bulge of the pit based on a change in the vicinity of the on/off control of the laser beam.

2. The optical information recording method according to claim 1, wherein in the case where a regenerative signal obtained from the optical information recording medium is binary-coded at a predetermined slice level so as to generate a binary-coded signal, a irradiation timing of the laser beam is corrected so that the binary-coded signal is variable on the basis of a predetermined basic period, and a pit length is varied in accordance with the second information on the basis of

the first information.

3. The optical information recording method according to claim 1 or 2, wherein a power of the laser beam is controlled so that a pit change based on the second information is gradually carried out according to a time axis.

4. The optical information recording method according to claim 1, 2 or 3 wherein a transition area of the pit change based on the second information ranges from 0.1 mm to 1 mm.

5. The optical information recording method according to claim 1, wherein the second information is expressed by a positional information by a polar coordinate on the optical information recording medium, and a power of the laser beam is modulated so as to be variable in accordance with the second information according to a time axis.

6. The optical information recording method according to claim 2, 3 or 4, wherein the irradiation timing of the laser beam is corrected according to a correction data stored in a correction data storing means.

7. An optical information recording apparatus which records a data overlapping a visibly second information on a

first information in an optical information recording medium by intermittently irradiating a laser beam so that a pit line is successively formed, comprising:

positional information generating means for generating a positional information so that the second information is recorded in a predetermined area in a radius direction and a angular direction on the optical information recording medium; and

optical modulating means for varying (modulating) a laser beam power so that the second information is recorded according to a change of a pit width based on a change of power of the laser beam, a change of a pit length based on an on/off control of the laser beam, or a change of depression or bulge of the pit based on a change in the vicinity of the on/off control of the laser beam.

8. The optical information recording apparatus according to claim 7, wherein in the case where a regenerative signal obtained from the optical information recording medium is binary-coded at a predetermined slice level so as to generate a binary-coded signal, a irradiation timing of the laser beam is corrected so that the binary-coded signal is variable on the basis of a predetermined basic period, and a pit length is varied in accordance with the second information on the basis of the first information.

9. The optical information recording apparatus according to claim 7 or 8, wherein a power of the laser beam is controlled so that a pit change based on the second information is gradually carried out according to a time axis.

10. The optical information recording apparatus according to claim 7, 8 or 9 wherein a transition area of the pit change based on the second information ranges from 0.1 mm to 1 mm.

11. The optical information recording apparatus according to claim 7, wherein the second information is expressed by a positional information by a polar coordinate on the optical information recording medium, and a power of the laser beam is modulated so as to be variable in accordance with the second information according to a time axis.

12. The optical information recording apparatus according to claim 8, 9 or 10, wherein the irradiation timing of the laser beam is corrected according to a correction data stored in a correction data storing means.

13. An optical information recording medium which records a data overlapping a visibly second information on a

first information by intermittently irradiating a laser beam so that a pit line is successively formed,

the second information being recorded in a predetermined area in a radius direction and a angular direction on the optical information recording medium,

the second information being recorded according to a change of a pit width based on a change of power of the laser beam, a change of a pit length based on an on/off control of the laser beam, or a change of depression or bulge of the pit based on a change in the vicinity of the on/off control of the laser beam.

14. The optical information recording medium according to claim 13, wherein in the case where a regenerative signal obtained from the optical information recording medium is binary-coded at a predetermined slice level so as to generate a binary-coded signal, a irradiation timing of the laser beam is corrected so that the binary-coded signal is variable on the basis of a predetermined basic period, and a pit length is varied in accordance with the second information on the basis of the first information.

15. The optical information recording medium according to claim 13 or 14, wherein a power of the laser beam is controlled so that a pit change based on the second information

is gradually carried out according to a time axis.

16. The optical information recording medium according to claim 13, 14 or 15, wherein a transition area of the pit change based on the second information ranges from 0.1 mm to 1 mm.

17. The optical information recording medium according to claim 13, wherein the second information is expressed by a positional information by a polar coordinate on the optical information recording medium, and a power of the laser beam is modulated so as to be variable in accordance with the second information according to a time axis.

18. The optical information recording medium according to claim 14, 15 or 16, wherein the irradiation timing of the laser beam is corrected according to a correction data stored in a correction data storing means.

19. An optical information recording apparatus which records a first information signal on an optical information recording medium by carrying out an on/off modulation of a laser beam source at a period of integer multiples of a predetermined basic period in accordance with a data to be recorded, and which records a change from a predetermined light intensity level to

other light intensity level, which is obtained from a micro equal interval step such that an inclination of the light intensity becomes substantially linear with respect to a second information signal and time by changing a light intensity of the laser beam source, on the optical information recording medium, comprising:

measuring means for measuring a laser intensity of the modulated laser beam;

control means for controlling a driving signal of the modulated laser beam;

characteristic measuring means for measuring a characteristic of laser beam intensity with respect to a predetermined pair of amplitudes of the driving signal obtained by the measuring means and the control means;

characteristic inverting means for carrying out an invert operation of the characteristic so as to determine a driving amplitude corresponding to a certain light intensity, and storing the result; and

timing correcting means for correcting a timing of the modulated signal in accordance with a light intensity level of the laser beam,

in the characteristic inverting means storing a driving amplitude for making a desired light intensity output, the light intensity of the laser beam being directly controlled during a change by investigating a necessary driving amplitude, and

further, the resultant regenerative signal of the optical information recording medium being smoothly variable in a recording range where a recording light intensity changes so that the optical information recording medium can be safely reproduce.

20. The optical information recording method which records a first information signal on an optical information recording medium, and which records a change from a predetermined light intensity level to other light intensity level, which is obtained from a micro equal interval step such that an inclination of the light intensity becomes substantially linear with respect to a second information signal and time by changing a light intensity of the laser beam source, on the optical information recording medium, and further includes a timing correcting step applied to the first information signal in accordance with a light intensity level, comprising the following steps of:

a measuring step of measuring a laser intensity of the modulated laser beam;

a control step of controlling a driving signal of the modulated laser beam;

an invert operation step of measuring a characteristic of laser beam intensity with respect to a predetermined pair of amplitudes of the driving signal obtained by the measuring means

and the control means, and carrying out an invert operation of the characteristic, and further, storing the invert operation value which is a driving signal corresponding to a certain light intensity; and

a timing correction value determining step of determining a timing correction value relative to an intermediate light intensity level in a displacement period of linearly interpolating a timing value at a predetermined light intensity level,

in the invert operation step of storing an invert operation characteristic for making a desired light intensity output, the light intensity of the laser beam being directly controlled during a change by investigating a necessary driving amplitude, and further, the resultant regenerative signal of the optical information recording medium being smoothly variable in a recording range where a recording light intensity changes so that the optical information recording medium can be safely reproduce.

21. An optical information recording medium which can record an information signal by carrying out an on/off modulation of a laser beam source,

a plurality of pits being formed so that a desired information is recorded, and a second information being recorded by selecting a pit having a pit width selected from

predetermined plural widths,

the selection of the pit having plural pit widths being carried out so that a light intensity of laser beam has a fixed inclination in a predetermined observing time, and in order to correct a change of a reflection light generated by a difference of pit width in a reproducing time, an edge position of the pit being adjusted in position, and thereby,

a watermark patter or visible image of the second information being included in the optical information recording medium while the information signal being reproduced.